

REMARKS

Please consider the following comments. Following this response, claims 1-6, 10-13, 21-23, and 26-34 are pending. Claims 7-9, 14-20, 24, and 25 have been canceled; claim 1 has been amended. Applicants respectfully request reconsideration and allowance of this application in view of the above amendments and the following remarks.

Election of Species

The Examiner has required a restriction to either species I directed to claims 1, 5, 6, and 24, and to species II directed to claim 34. Since claim 34 was newly added, the Examiner noted that Applicants had therefore constructively elected species I.

Applicants note this election, and respectfully traverse it. As amended, claim 1 recites “a connection member that connects at least one antenna electrode among said plurality of antenna electrodes to said ground electrode, *at least at one spot thereof which is different from said feed point, the connection member being configured such that at least one antenna electrode among the plurality of antenna electrodes is unconnected to said ground electrode.*” In comparison, claim 34 recites “a connection member that *selectively* connects at least one antenna electrode among said plurality of antenna electrodes to said ground electrode *in response to one or more control signals, at least at one spot of the connection member being different from said feed point.*” All other portions of these claims are identical.

The Examiner asserts that these claims have mutually exclusive characteristics. However, this is not the case between amended claim 1 and claim 34. It is possible for a device to meet the limitations of both amended claim 1 and claim 34. In particular, the device would simply have to have a “a connection member that selectively connects at least one antenna electrode among said

plurality of antenna electrodes to said ground electrode in response to one or more control signals, the connection member being unconnected to at least one antenna electrode among the plurality of antenna electrodes, at least at one spot of the connection member being different from said feed point, the connection member being configured such that at least one antenna electrode among the plurality of antenna electrodes is unconnected to said ground electrode."

Thus, these two claims should not require a different field of search, prior art applicable to one claim should also be applicable to the other, and the two claims should not raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

Therefore, Applicants respectfully request that the Examiner rejoin claim 34 and examine this claim.

Rejections – 35 U.S.C. § 112, First Paragraph

The Examiner has rejected claim 24 under 35 U.S.C. § 112, first paragraph, as allegedly not being described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

By this response, Applicants have canceled claim 24, thus rendering moot this ground of rejection.

Applicants therefore respectfully request that the Examiner withdraw the rejection of claim 24 under 35 U.S.C. § 112, first paragraph, as allegedly not being described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

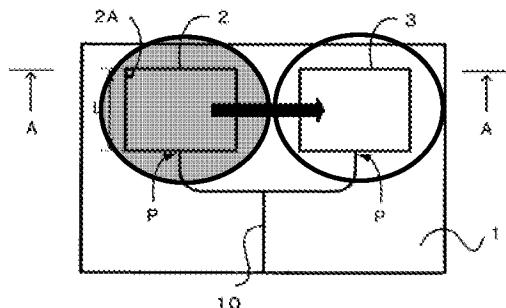
Rejections - 35 U.S.C. § 102

The Examiner has rejected claims 1 and 5 under 35 USC § 102(e) as being allegedly unpatentable over United States Patent Publication No. 2003/0164797 to Ngai et al. (“Ngai”). Applicants respectfully request that this rejection be withdrawn for the following reasons.

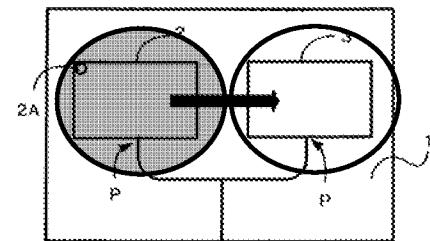
By this response Applicants have amended claim 1 to recite “a connection member that connects at least one antenna electrode among said plurality of antenna electrodes to said ground electrode, at least at one spot thereof which is different from said feed point, the connection member being configured such that at least one antenna electrode among the plurality of antenna electrodes is unconnected to said ground electrode.” Support for this amendment can be found, for example, in from page 24, line 6, through page 25, line 14, of Applicants’ specification (paragraph 0014 of the published specification), and in Applicants’ FIGs. 2 and 3.

Thus, one of the features of amended claim 1 is that fewer than all of the plurality of antenna electrodes are connected to the ground electrode at once. By having at least one antenna electrode connected to the ground electrode and at least one antenna electrode *not* connected to the ground electrode, an integrated radio wave beam can be effectively inclined from a direction normal to the surface of the substrate. This can be seen, by way of example, in Applicants’ FIGs. 2, 5, and 8-12, and related portions of the specification.

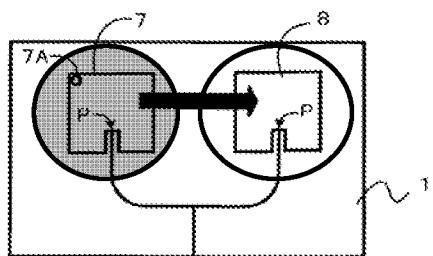
As noted previously, because of this, according to amended claim 1, a direction of a radio wave beam can be quite easily and efficiently changed by simply connecting at least one of the antenna electrode to the ground electrode while at least one another antenna electrode is not connected to the ground electrode.



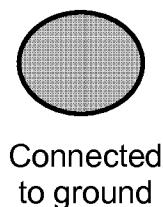
Applicants' FIG. 2



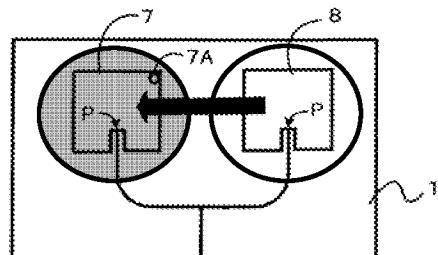
Applicants' FIG. 5



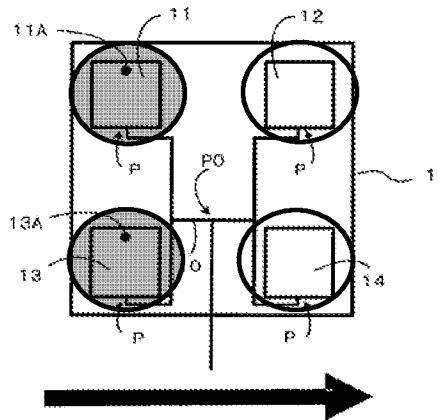
Applicants' FIG. 8



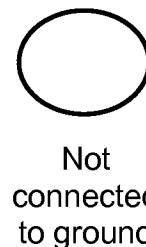
Connected to ground



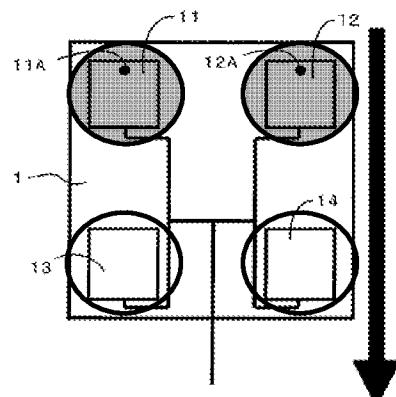
Applicants' FIG. 9



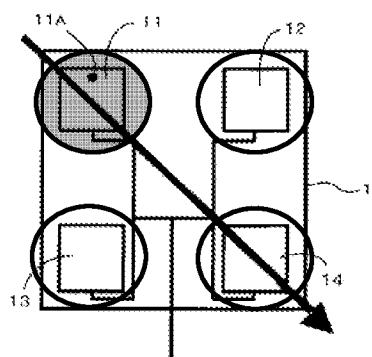
Applicants' FIG. 10



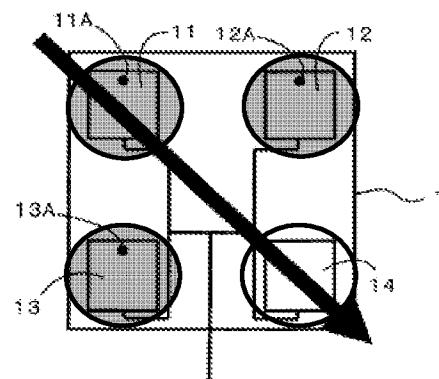
Not connected to ground



Applicants' FIG. 11



Applicants' FIG. 12



Applicants' FIG. 13

In contrast, Ngai discloses that all of the antenna elements 14/ patch elements 54 (what the Examiner relies upon for a teaching of the recited antenna electrodes) are simultaneously connected to the ground planes 20, 60/lower patch elements 56 (what the Examiner relies upon for a teaching of the recited ground electrode). As noted above, if all of the antenna elements/patch elements are connected to the ground plane/lower patch element, the radio wave beam will not be inclined. This can be seen in FIGs. 1 and 3 of Ngai.

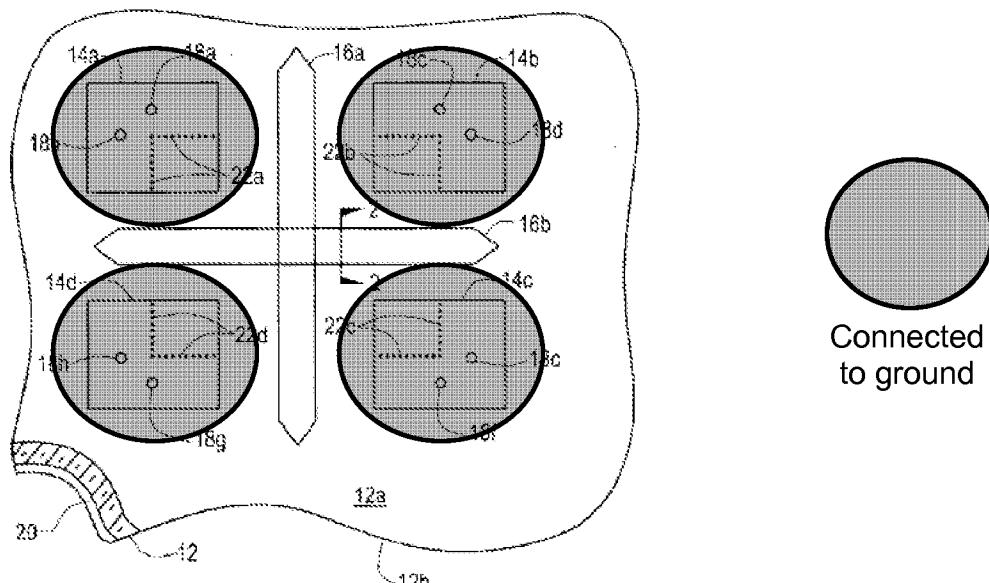


FIG. 1

FIG. 1 of Ngai

In addition, claim 1 recites that the “connection member is disposed at a location within a plane region occupied by said at least one antenna electrode when said at least one antenna electrode is seen in plan view, *such that a direction of an integrated radio wave beam which is emitted from said plurality of antenna electrodes is inclined from a direction normal to said substrate by connecting said at least one antenna electrode to said ground electrode at said location.*”

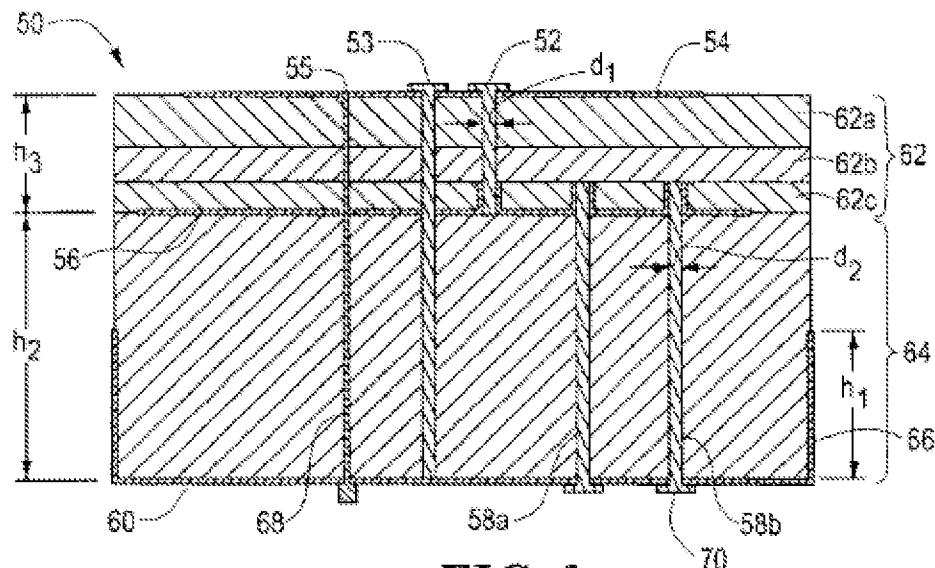


FIG. 3
FIG. 3 of Ngai

However, in the antenna array of Ngai, all of the antenna elements 14a-14d have the same configuration. For example, each of the antenna elements 50 includes one or more upper tuning structures 52 and one or more lower tuning structures 58a, 58b, and the feed 55. (See, e.g., paragraphs 009-0031 of Ngai.) Thus, in Ngai's feed array, there will be no phase difference produced between wave beams that are radiated from the antenna elements 50, and the direction of the radiated beams will not be inclined. The Examiner appears to assert that this feature is shown in Ngai, although not explicitly stated, since the configuration of the electrode and ground in Ngai is the same as recited in claim 1, and would therefore perform the claimed function. Applicants respectfully disagree with this characterization for two reasons.

First, as noted above, the configuration of Ngai is *not* the same as the configuration recited in claim 1 for at least the reasons given above. Thus, the operation of the device disclosed in Ngai is *not* the same as the device recited in amended claim 1.

Second, the Examiner appears to characterize this limitation as being strictly functional. However claim 1 describes the disposition of the connection member. Therefore, this is a structural limitation. The connection member must be disposed at a particular location such that that a direction of an integrated radio wave beam which is emitted from said plurality of antenna electrodes is inclined from a direction normal to said substrate by connecting said at least one antenna electrode to said ground electrode at said location.

Thus, Ngai does not disclose “the connection member being unconnected to at least one antenna electrode among the plurality of antenna electrodes,” or that “a direction of an integrated radio wave beam which is emitted from said plurality of antenna electrodes is inclined from a direction normal to said substrate by connecting said at least one antenna electrode to said ground electrode at said location,” as recited in amended claim 1.

Claim 5 depends from claim 1 and is allowable for at least the reasons given above for claim 1.

Therefore, based on at least the reasons given above, Applicants respectfully request that the Examiner withdraw the rejection of claims 1 and 5 under 35 USC § 102(e) as being unpatentable over Ngai.

The Examiner has rejected claims 1, 6, and 24 under 35 U.S.C. § 102(b) as being allegedly anticipated by United States Patent No. 6,195,047 to Richards (“Richards”). Applicants respectfully request that this rejection be withdrawn for the following reasons.

By this response Applicants have canceled claim 24, thus rendering moot this ground of rejection as it pertains to these claims.

As noted above, claim 1 has been amended to better recite the connection member. In particular, Applicants have amended claim 1 to recite “the connection member being configured such that at least one antenna electrode among the plurality of antenna electrodes is unconnected to said ground electrode”;

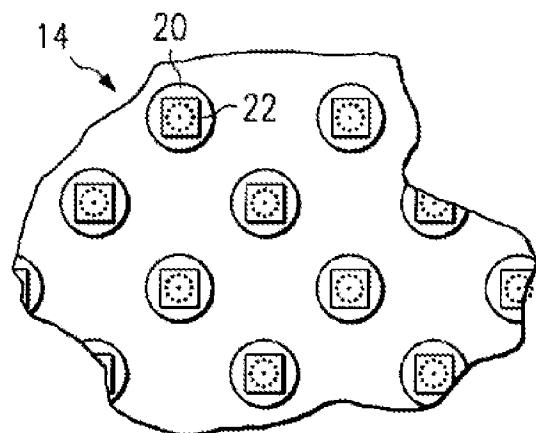


FIG. 2A of Richards

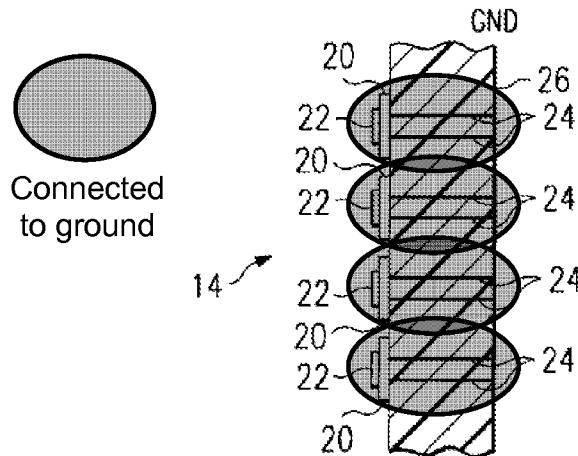


FIG. 2B of Richards

In contrast, Richards discloses that all of the short microstrip patches 20 (what the Examiner relies upon for a teaching of the recited antenna electrodes) are simultaneously connected to the ground plane 26 (what the Examiner relies upon for a teaching of the recited ground electrode). Thus, what the Examiner relies upon as showing the recited connection member is not configured such that at least one antenna electrode among the plurality of antenna electrodes is unconnected to the ground electrode. Therefore, Richards does not disclose “the connection member being configured such that at least one antenna electrode among the plurality of antenna electrodes is unconnected to said ground electrode,” as recited in amended claim 1.

In addition, claim 1 recites that the “connection member is disposed at a location within a plane region occupied by said at least one antenna electrode when said at least one antenna electrode is seen in plan view, such that a direction of an integrated radio wave beam which is

emitted from said plurality of antenna electrodes is inclined from a direction normal to said substrate by connecting said at least one antenna electrode to said ground electrode at said location.” The Examiner appears to assert that this feature is shown in Richards, although not explicitly stated, since the configuration of the electrode and ground in Richard is the same as recited in claim 1, and would therefore perform the claimed function. Applicants respectfully disagree with this characterization for two reasons.

First, if all of the short microstrip patches 20 are connected to the ground plane, the radio wave beam will not be inclined. This can be seen in FIGs. 2A and 2B of Richards. Thus, the configuration of Richard is *not* the same as the configuration recited in claim 1. Therefore, the operation of the device disclosed in Richard is *not* the same as the device recited in amended claim 1.

Second, the Examiner appears to characterize this limitation as being strictly functional. However claim 1 describes the disposition of the connection member. Therefore, this is a structural limitation. The connection member must be disposed at a particular location such that that a direction of an integrated radio wave beam which is emitted from said plurality of antenna electrodes is inclined from a direction normal to said substrate by connecting said at least one antenna electrode to said ground electrode at said location.

Furthermore, claim 1 recites “a plurality of antenna electrodes disposed upon one surface of said substrate, each having a feed point for application of a radio wave signal.” Nothing in Richards discloses or suggests this feature.

The Examiner asserts that elements 41-48 in FIG. 4 of Richards show the recited feed points. However, elements 42, 44, 50, 46, and 48 are connected to controller 22 and carry control

signals. (See, e.g., Richards, column 5, lines 14-17.) Thus, elements 41-48 are not all feed points, as that term would be understood by one of ordinary skill in the art.

Claim 6 depends from claim 1 and is allowable for at least the reasons given above for claim 1.

Therefore, for at least the reasons given above, Applicants respectfully request that the Examiner withdraw the rejection of claims 1, 6, and 24 under 35 U.S.C. § 102(b) as being allegedly anticipated by Richards.

Conclusion

Applicants respectfully submit that, as described above, the cited prior art does not show or suggest the combination of features recited in the claims. Applicants do not concede that the cited prior art shows any of the elements recited in the claims. However, Applicants have provided specific examples of elements in the claims that are clearly not present in the cited prior art.

Applicants strongly emphasize that one reviewing the prosecution history should not interpret any of the examples Applicants have described herein in connection with distinguishing over the prior art as limiting to those specific features in isolation. Rather, for the sake of simplicity, Applicants have provided examples of why the claims described above are distinguishable over the cited prior art.

In view of the foregoing, Applicants submit that this application is in condition for allowance. A timely notice to that effect is respectfully requested. If questions relating to patentability remain, the Examiner is invited to contact the undersigned by telephone.

Although it is not anticipated that any additional fees are due or payable, the Commissioner is hereby authorized to charge any fees that may be required to Deposit Account No. 50-1147.

Respectfully Submitted,

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